C. Self Monitoring Reports (SMRs)

1. At any time during the term of this Order, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. The Discharger shall submit monthly and annual SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR. Monthly SMRs shall be due on the 30th day following the end of each calendar month, covering samples collected during that calendar month; annual reports shall be due on February 1 following each calendar year.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-7. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period
Continuous	Day after permit effective date	All
Hourly	Day after permit effective date	Hourly
Daily	Day after permit effective date	Midnight through 11:59 PM or any 24-hour period that reasonably represents a calendar day for purposes of sampling.
Weekly	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1st day of calendar month through last day of calendar month
Quarterly	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31
Semiannually	Closest of January 1 or July 1 following (or on) permit effective date	January 1 through June 30 July 1 through December 31
Annually	January 1 following (or on) permit effective date	January 1 through December 31

4. Reporting Protocols. The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified" (DNQ) or "J" flagged. The estimated chemical concentration of the sample shall also be reported.

   For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

c. Sample results less than the laboratory's MDL shall be reported as "Not Detected (ND) or <."

d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

5. The Discharger shall submit SMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

   Executive Officer
   California Regional Water Quality Control Board
   San Francisco Bay Region
   1515 Clay Street, Suite 1400

Oakland, CA 94612
ATTN: NPDES Wastewater Division

D. Discharge Monitoring Reports (DMRs)

1. As described in section XI.B.1 above, at any time during the term of this Order, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to the address listed below:

   State Water Resources Control Board
   Discharge Monitoring Report Processing Center
   PO Box 671
   Sacramento, CA 95812

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated or modified will not be accepted.

E. Other Reports

Annual Reports. By February 1st of each year, the Discharger shall submit an annual report to the Regional Water Board covering the previous calendar year. The report shall contain the items described in Standard Provisions and Reporting Requirements, and SMP Part A, August 1993 (**Attachment G**).

APPENDIX E-1
CHRONIC TOXICITY
DEFINITION OF TERMS AND SCREENING PHASE REQUIREMENTS

I. Definition of Terms

A. No observed effect level (NOEL) for compliance determination is equal to IC_{25} or EC_{25}. If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.

B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Karber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25 percent of the test organisms.

C. Inhibition concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a nonlethal, nonquantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25 percent reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as USEPA's Bootstrap Procedure.

D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

II. Chronic Toxicity Screening Phase Requirements

A. The Discharger shall perform screening phase monitoring:

1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to source control efforts, or

2. Prior to permit reissuance. Screening phase monitoring data shall be included in the NPDES permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

B. Design of the screening phase shall, at a minimum, consist of the following elements:

1. Use of test species specified in **Appendix E-2**, attached, and use of the protocols referenced in those tables, or as approved by the Executive Officer.

2. Two stages:

   a. Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on **Appendix E-2** (attached).

   b. Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.

3. Appropriate controls.

4. Concurrent reference toxicant tests.

5. Dilution series 100%, 50%, 25%, 10%, 5%, 0 %, where "%" is percent effluent as discharged, or as otherwise approved the Executive Officer.

C. The Discharger shall submit a screening phase proposal acceptable to the Executive Officer. The proposal shall address each of the elements listed above. If within 30 days, the Executive Officer does not comment, the Discharge shall commence with screening phase monitoring.

APPENDIX E-2
SUMMARY OF TOXICITY TEST SPECIES REQUIREMENTS

Critical Life Stage Toxicity Tests for Estuarine Waters

Species	(Scientific Name)	Effect	Test Duration	Reference
Alga	*(Skeletonema costatum) (Thalassiosira pseudonana)*	Growth rate	4 days	1
Red alga	*(Champia parvula)*	Number of cystocarps	7–9 days	3
Giant kelp	*(Macrocystis pyrifera)*	Percent germination; germ tube length	48 hours	2
Abalone	*(Haliotis rufescens)*	Abnormal shell development	48 hours	2
Oyster Mussel	*(Crassostrea gigas)* *(Mytilus edulis)*	Abnormal shell development; percent survival	48 hours	2
Echinoderms - Urchins Sand dollar	*(Strongylocentrotus purpuratus, S. franciscanus)* *(Dendraster excentricus)*	Percent fertilization	1 hour	2
Shrimp	*(Mysidopsis bahia)*	Percent survival; growth	7 days	3
Shrimp	*(Holmesimysis costata)*	Percent survival; growth	7 days	2
Topsmelt	*(Atherinops affinis)*	Percent survival; growth	7 days	2
Silversides	*(Menidia beryllina)*	Larval growth rate; percent survival	7 days	3

Toxicity Test References:

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for Conducting Static 96-Hour Toxicity Tests with Microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.

2. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. August 1995.

3. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms. EPA/600/4-90/003. July 1994. Later editions may replace this version.

Critical Life Stage Toxicity Tests for Fresh Waters

Species	(Scientific Name)	Effect	Test Duration	Reference
Fathead minnow	*(Pimephales promelas)*	Survival; growth rate	7 days	4
Water flea	*(Ceriodaphnia dubia)*	Survival; number of young	7 days	4
Alga	*(Selenastrum capricornutum)*	Cell division rate	4 days	4

Toxicity Test Reference:

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, third edition. EPA/600/4-91/002. July 1994. Later editions may replace this version.

Toxicity Test Requirements for Stage One Screening Phase

Requirements	Receiving Water Characteristics		
	Discharges to Coast	Discharges to San Francisco Bay[2]	
	Ocean	Marine/Estuarine	Freshwater
Taxonomic diversity	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish	1 plant 1 invertebrate 1 fish
Number of tests of each salinity type: Freshwater[1] Marine/Estuarine	0 4	1 or 2 3 or 4	3 0
Total number of tests	4	5	3

[1] The freshwater species may be substituted with marine species if:
(a) The salinity of the effluent is above 1 part per thousand (ppt) greater than 95 percent of the time, or
(b) The ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.

[2] (a) Marine/Estuarine refers to receiving water salinities greater than 1 ppt at least 95 percent of the time during a normal water year.
(b) Fresh refers to receiving water with salinities less than 1 ppt at least 95 percent of the time during a normal water year.

ATTACHMENT F - FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility.

Table F-1. Facility Information

WDID	2 417005001
Discharger	City of Burlingame and North Bayside System Unit
Name of Facility	City of Burlingame Wastewater Treatment Facility
Facility Address	1103 Airport Boulevard Burlingame, CA 94010 San Mateo County
Facility Contact, Title and Phone	William Toci, Plant Manager (650) 342-3727
Authorized Person to Sign and Submit Reports	William Toci, Plant Manager
Mailing Address	501 Primrose Road Burlingame, CA 94010
Billing Address	Same as Mailing Address
Type of Facility	POTW
Major or Minor Facility	Major
Threat to Water Quality	2
Complexity	A
Pretreatment Program	Yes
Reclamation Requirements	None
Facility Permitted Flow	5.5 million gallons per day (mgd) average dry weather flow
Facility Design Flow	5.5 mgd (current dry weather average design flow) 16 mgd (design wet weather peak flow)
Watershed	San Francisco Bay
Receiving Water	Lower San Francisco Bay
Receiving Water Type	Marine

A. The City of Burlingame owns and Veolia West Operating Service Inc. operates the City of Burlingame Wastewater Treatment Facility (Facility).

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. The Facility discharges treated wastewater into the deep-water channel of Lower San Francisco Bay, a water of the United States, and is currently regulated by Order No. R2-2002-0027 and NPDES Permit No. CA0037788, which was adopted on February 27, 2002.

The terms and conditions of the 2002 Order have been automatically continued past the Order's original expiration date of January 1, 2007 and remain in effect until new Waste Discharge Requirements (WDRs) and NPDES permit are adopted pursuant to this Order.

C. The Discharger filed a Report of Waste Discharge and submitted an application for renewal of its WDRs and NPDES permit on May 24, 2006. The application was deemed complete on June 16, 2006. The application was deemed complete on June 16, 2006.

II. FACILITY DESCRIPTION

A. Description of Wastewater Treatment or Controls

The Discharger owns and Veolia West Operating Service Inc. operates the municipal Facility, a secondary wastewater treatment facility and its collection system. The Facility provides secondary level treatment for domestic and commercial wastewater from a service area with a population of approximately 37,000. The cities of Burlingame (population 30,000) and Hillsborough (6,000), and unincorporated areas of San Mateo County (1,000) contribute to influent flows to the Facility.

Treated, disinfected wastewater is discharged from Monitoring Location E-001 to the North Bayside System Unit (NBSU) force main. Wastewater flow at E-001, as identified by this Order, represents the Facility discharge prior to combining with the NBSU effluent. The members of NBSU are the cities of Millbrae, South San Francisco, and San Bruno, and San Francisco International Airport. Treated, disinfected wastewater collected by the NBSU is dechlorinated at the City of South San Francisco Water Quality Control Plant, and the combined effluent is discharged through a submerged diffuser into the deep-water channel of Lower San Francisco Bay, a water of the State and the United States. The diffuser is approximately 5,300 feet offshore at a depth of 20 feet below mean lower low water and is located northeast of Point San Bruno (at Latitude 37 degrees, 39 minutes, 55 seconds N and Longitude 122 degrees, 21 minutes, 41 seconds W). A second outfall (at Latitude 37 degrees, 39 minutes, 32 seconds N and Longitude 122 degrees, 21 minutes, 15 seconds W) is used by the Discharger for emergency discharges during storm events. This outfall is a shallow-water, nearshore discharge via a gated weir just off the Discharger's final clarifier "B" after final chlorine contact. The nearshore discharge has been used four times since 2002 (December 13, 2002, December 16, 2002, January 1, 2004, and December 31, 2005). The duration of the discharge was typically no longer than 12 hours, with the average discharge volume being 2.26 million gallons and the maximum being 3.7 million gallons. This Order does not permit the discharge of wastewater through the nearshore outfall and includes a provision requiring the Discharger to eliminate discharge from this outfall.

The Discharger has an average dry weather flow design capacity of 5.5 million gallons per day (mgd), and can treat up to 16 mgd during wet weather. In 2005, the Facility discharged an average dry weather flow of 3.56 mgd, had an average wet weather discharge of about 11 mgd and an annual average flow of about 4.4 mgd (2004 and 2005 data). The Discharger has a primary treatment capacity of 25 mgd and disinfection capacity of 20 mgd. During wet weather operations, the aeration basins and secondary clarifiers may be bypassed, with the final effluent being a blend of disinfected, primary-treated effluent and disinfected, secondary-treated effluent. Blending is done to avoid

hydraulic overload of the activated sludge process and associated solids inventory washout. The discharge is classified by the U.S. Environmental Protection Agency (USEPA) and the Regional Water Board as a deepwater discharge.

The wastewater treatment process at the Facility consists of screening, grit removal, primary clarification (2 primary clarifiers), activated sludge biological treatment (4 aeration basins), secondary clarification (4 secondary clarifiers), and disinfection with sodium hypochlorite. Treated effluent flows via pipeline to the NBSU dechlorination facility. In transit or at the NBSU dechlorination facility, treated effluent is combined with effluent from the cities of Millbrae, South San Francisco, and San Bruno and industrial and sanitary wastewater from the San Francisco International Airport. The combined effluent is dechlorinated prior to discharge to Lower San Francisco Bay.

The Discharger recently completed a $10 million "Reliability Project." These upgrades included:

- New sludge de-watering building
- New sludge transfer station
- New diffusers in the aeration basins
- New aeration blower system with automated equipment
- New waste gas burners
- Head works odor control improvement
- New compactors (bar screens)
- New vacuum truck unloading stations

A portion of the storm water captured within the wastewater treatment plant storm drain system is directed to the headworks of the treatment plant and treated to the standards contained in this Order; therefore, the facility will continue to operate under the General Industrial Storm Water Permit No. CAS000001.

Biosolids collected from the wastewater treatment process undergo thickening in a gravity thickener, are anaerobically digested and stabilized in an anaerobic digester, and dewatered by a belt filter press. In 2005, the Facility generated 665 dry metric tons of Class B biosolids, and 181 dry metric tons of dewatered biosolids were disposed of at the Potrero Hills Landfill in Suisun City, California. The Discharger currently contracts through its agent, Veolia West Operating Service Inc., to have the remaining 484 dry metric tons of dewatered biosolids hauled and land applied by SynaGro West, Inc., its contract land applier. Under the terms of that contract, SynaGro is responsible for complying with the monitoring and reporting requirements of the 40 CFR 503 regulations for the biosolids and files annual reports with USEPA Region IX.

B. Discharge Points and Receiving Waters

The locations of the Facility's outfall and its receiving water are shown in Table F-2 below.

Table F-2. Outfall Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
E-002	Secondary Treated POTW Effluent	37°, 35.5', 29" N	122 °, 21', 43.9" W	Lower San Francisco Bay

Lower San Francisco Bay is located in the South Bay Basin watershed management area, between the Dumbarton Bridge to the south and the San Francisco-Oakland Bay Bridge to the north.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

Effluent limitations contained in Order No. R2-2002-0027 for discharges from the Facility outfall and representative monitoring data from the term of the previous Order are as follows:

Table F-3. Historic Effluent Limitations and Monitoring Data for E-001

Parameter	(units)	Effluent Limitations			Monitoring Data (From 1/02 To 9/06)	
		Monthly Average	Weekly Average	Instantaneous Maximum	Mean Discharge	Maximum Discharge
Flow Rate	mgd	---	---	---	4.24 (Daily Avg.)	20 (Daily Max.)
BOD_5	mg/L	30	45	--	8.08	70
TSS	mg/L	30	45	--	17.3	274
Settleable Matter	ml/L-hr	0.1	--	0.2 (Daily Max.)	0.1	0.125
Oil & Grease	mg/l	10	--	20 (Daily Max.)	2.7	8
pH	pH units	6.0 to 9.0			6.63 (min.)	8.02 (max.)
Fecal Coliform	MPN/100 ml	5-day Geometric mean = 200 10-sample 90th percentile = 400			5-day Geometric mean (max) = 26.7 10-sample 90th percentile (max) = 30	

Table F-4. Historic Toxic Pollutants Effluent Limitations and Monitoring Data for E-001

Parameter	Units	Water Quality-Based Effluent Limits (WQBELs)		Interim Limits		Monitoring Data (From 1/02 To 12/05)	
		Daily Maximum	Monthly Average	Daily Maximum	Monthly Average	Mean Daily Discharge	Maximum Daily Discharge
Copper	µg/L	---	---	---	27.0	7.9	38
Mercury	µg/L	---	---	---	0.087	0.009	0.086
Nickel	µg/L	64	32.7	---	---	3.72	6.6
Silver	µg/L	21.8	11.8	---	---	0.37	2.1
Zinc	µg/L	691	496	---	---	32.8	60
Cyanide	µg/L	---	---	10	---	3.7	26
Alpha-BHC	µg/L	---	---	---	0.04	<0.004	<0.004
4,4-DDE	µg/L	0.00119	0.00059	---	---	<0.001	<0.001
Dieldrin	µg/L	---	---	---	0.075	<0.002	<0.002

Table F-5. Toxicity Limitations and Monitoring Data for E-001

Species	Units	Effluent Toxicity Limits & Monitoring Data[1]			
		Acute		Chronic	
		11-sample median	11-sample 90th percentile	3-sample median	Single sample max.
Pimephales promelas	% Survival	≥ 90	≥ 70	---	---
		94.7	91.4	---	---
Mysidopsis bahia	TU_c	---	---	≤ 10	≤ 20
		---	---	5.2	6

(1) For each species, the effluent toxicity limit is listed in the top row and monitoring data are listed in the bottom row.

D. Compliance Summary

1. **Compliance with Numeric Effluent Limits.** Exceedances of numeric effluent limits were observed during the permit term for TSS, copper, and cyanide. The exceedances are outlined below:

Table F-6. Numeric Effluent Exceedances

Date of Violation	Exceeded Parameter	Units	Effluent Limitation	Reported Concentration
August 31, 2002	Copper – Monthly Average	µg/L	27	38
June 19, 2003	Cyanide – Daily Maximum	µg/L	10	13
December 27, 2003	Total Suspended Solids – Weekly Average	mg/L	45	52.03
May 4, 2005	Cyanide – Daily Maximum	µg/L	10	26
August 3, 2005	Cyanide – Daily Maximum	µg/L	10	18

The Regional Water Board has taken enforcement actions on these violations. The latest action was for the assessment of maximum minimum penalties in Order R2-2007-0050. Since changing analytical methods, cyanide results have all been below 10 µg/L.

2. **Compliance with Submittal of Self-Monitoring Reports.** The Discharger submitted all Self-Monitoring Reports on or before the due date during the term of Order No. R2-2002-0027.

E. Planned Changes

The Discharger recently completed a Reliability Project designed to upgrade existing equipment and reduce the need to blend. The Discharger plans to construct a 660,000 gallon retention basin to further reduce the need to blend.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order is issued pursuant to CWA section 402 and implementing regulations adopted by the USEPA and Chapter 5.5, Division 7 of the CWC (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to CWC Article 4, Chapter 4, Division 7 (commencing with section 13260).

B. California Environmental Quality Act (CEQA)

Under CWC section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** *The Water Quality Control Plan for the San Francisco Bay Basin* (the Basin Plan) is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Regional Water Board and approved by the State Water Resources Control Board, USEPA, and the Office of Administrative Law, as required. The Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which establishes state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Because of the marine influence on receiving waters of the San Francisco Bay, total dissolved solids levels in the Bay commonly (and often significantly) exceed 3,000 mg/L and thereby meet an exception to State Water Board Resolution No. 88-63. Therefore, the designation MUN is not applicable to the Lower San Francisco Bay. Beneficial uses applicable to Lower San Francisco Bay are as follows:

Table F-7. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
E-002	Lower San Francisco Bay	Industrial Service Supply (IND) Navigation (NAV) Water Contact Recreation (REC1) Non-Contact Water Recreation (REC2) Ocean, Commercial and Sport Fishing (COMM) Wildlife Habitat (WILD) Preservation of Rare and Endangered Species (RARE) Fish Migration (MIGR) Shellfish Harvesting (SHELL) Estuarine Habitat (EST)

Requirements of this Order implement the Basin Plan.

2. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, which was amended on May 4, 1995, and

November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority toxic pollutants, which are applicable to the Lower San Francisco Bay.

3. **State Implementation Policy.** On March 2, 2000, State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005 that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

4. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes [40 C.F.R. § 131.21, 65 Fed. Reg. 24641 (April 27, 2000)]. Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

5. **Stringency of Requirements for Individual Pollutants.** This Order contains restrictions on individual pollutants that are no more stringent than required by the federal CWA. Individual pollutant restrictions consist of technology-based restrictions and water quality-based effluent limitations. The technology-based effluent limitations consist of restrictions on BOD, TSS, oil and grease, pH, and chlorine residual. Restrictions on these pollutants are specified in federal regulations and are no more stringent than required by the CWA. WQBELs have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant WQBELs were derived from the CTR, the CTR is the applicable standard pursuant to section 131.38. The scientific procedures for calculating the individual WQBELs are based on the CTR-SIP, which was approved by USEPA on May 18, 2000. Most beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to section 131.21(c)(1). The remaining water quality objectives and beneficial uses implemented by this Order were approved by USEPA on January 5, 2005, and are applicable water quality standards

pursuant to section 131.21(c)(2). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

6. **Antidegradation Policy.** 40 CFR 131.12 requires that State water quality standards include an antidegradation policy consistent with the Federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the requirements of the federal antidegradation policy. Resolution 68-16 requires that existing water quality is maintained unless degradation is justified based on specific findings.

   The permitted discharge is consistent with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution No. 68-16, and the final limitations in this Order are in compliance with antidegradation requirements and meet the requirements of the SIP because these limits hold the Discharger to performance levels that will not cause or contribute to water quality impairment or further water quality degradation. This is because this Order does not provide for an increase in the permitted design flow, allow for a reduction in the level of treatment, or increase effluent limitations, with the exception of cyanide and copper.

   For cyanide, the revised limits will not degrade water quality because the permitted flow will remain unchanged and the level of treatment provided by the Facility will not be reduced. The new limits are equivalent to those anticipated in the antidegradation analysis section of the Staff Report supporting the cyanide site-specific objectives. Documentation completed for the standards setting process for cyanide addressed antidegradation. That analysis concluded that these new limits would not likely result in degradation and that any increase would not have a measurable impact on ambient cyanide levels in the Bay. Since the limits anticipated with the site-specific objectives would not degrade the quality of the receiving water, neither will the increased limits in this permit. As such there will be no lowering of water quality beyond the current level authorized in the previous permit, which is the baseline by which to measure whether degradation will occur. Moreover, this Order requires implementation of an action plan for cyanide source identification and pollution minimization. These measures will further ensure that existing water quality is maintained or improved.

   For copper, this Order establishes final WQBELs, whereas the previous permit included interim limits. Although the final WQBELs are above the previous interim limitations, the concentration of copper discharges is unlikely to change because the Discharger proposes no changes to its treatment process. The Discharger will maintain current treatment performance for copper because it cannot manipulate its process to adjust effluent copper levels independently of other treatment parameters. To maintain compliance with other effluent limits, the Discharger will maintain its current performance with respect to copper. Moreover, pollution minimization requirements are designed to maintain current performance. Additionally, this Order establishes alternate limits for copper based on site-specific objectives developed since the previous permit. These limits will become effective if the site-specific objective is adopted during the permit term. Like cyanide, the

standards setting process for copper addressed antidegradation, and therefore, an analysis in this permit is unnecessary.

The Order continues the status quo with respect to the level of discharge authorized in the previous permit and thus there will be no change in water quality beyond the level that was authorized in the last permit. Findings authorizing degradation are thus not applicable.

7. **Anti-Backsliding Requirements.** CWA Sections 402(o)(2) and 303(d)(4) and NPDES regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous Order, with some exceptions in which limitations may be relaxed. All effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order.

D. Impaired Water Bodies on CWA 303(d) List

In November 2006, the USEPA approved a revised list of impaired water bodies prepared by the State [hereinafter referred to as the 303(d) list], prepared pursuant to provisions of CWA section 303(d), which requires identification of specific water bodies where it is expected that water quality standards will not be met after implementation of technology-based effluent limitations on point sources. Lower San Francisco Bay is listed as impaired by chlordane, DDT, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, PCBs, and dioxin-like PCBs. The SIP requires final effluent limitations for all 303(d)-listed pollutants to be consistent with total maximum daily loads and associated waste load allocations.

1. Total Maximum Daily Loads

The Regional Water Board plans to adopt Total Maximum Daily Loads (TMDLs) for pollutants on the 303(d) list in Lower San Francisco Bay within the next ten years. Future review of the 303(d)-list for Lower San Francisco Bay may provide schedules or result in revision of the schedules for adoption of TMDLs.

2. Waste Load Allocations

The TMDLs will establish waste load allocations (WLAs) for point sources and load allocations (LAs) for non-point sources, and will result in achieving the water quality standards for the waterbodies. Final WQBELs for 303(d)-listed pollutants in this discharge will be based on WLAs contained in the respective TMDLs.

3. Implementation Strategy

The Regional Water Board's strategy to collect water quality data and to develop TMDLs is summarized below:

a. **Data Collection.** The Regional Water Board has given dischargers to San Francisco Bay the option to collectively assist in developing and implementing analytical techniques capable of detecting 303(d)-listed pollutants to at least their respective levels of concern or WQOs/WQC. This collective effort may include

development of sample concentration techniques for approval by the USEPA. The Regional Water Board will require dischargers to characterize the pollutant loads from their facilities into the water-quality limited waterbodies. The results will be used in the development of TMDLs and may be used to update or revise the 303(d) list or change the WQOs/WQC for the impaired waterbodies including Lower San Francisco Bay.

b. **Funding Mechanism.** The Regional Water Board has received, and anticipates continuing to receive, resources from Federal and State agencies for TMDL development. To ensure timely development of TMDLs, the Regional Water Board intends to supplement these resources by allocating development costs among dischargers through the RMP or other appropriate funding mechanisms.

E. Other Plans, Polices and Regulations

This Order is also based on the following plans, polices, and regulations:

1. Federal *Water Pollution Control Act*, Sections 301 through 305, and 307, and amendments thereto, as applicable (CWA);
2. State Water Board's *Policy for* the USEPA's May 18, 2000 *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California* or CTR, 40 C.F.R. §131.38(b) and amendments,;
3. USEPA's *Quality Criteria for Water* [EPA 440/5-86-001, 1986] and subsequent amendments (the USEPA Gold Book);
4. Applicable Federal Regulations [40 CFR §§ 122 and 131];
5. 40 CFR §131.36(b) and amendments [Federal Register Volume 60, Number 86, 4 May 1995, pages 22229-22237];
6. USEPA's December 10, 1998 National Recommended Water Quality Criteria compilation [Federal Register Vol. 63, No. 237, pp. 68354-68364];
7. USEPA's December 27, 2002 Revision of National Recommended Water Quality Criteria compilation [Federal Register Vol. 67, No. 249, pp. 79091-79095]; and
8. Guidance provided with State Water Board Orders remanding permits to the Regional Water Board for further consideration.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the NPDES regulations: 40 CFR 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 CFR 122.44(d) requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable

numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs may be established using: (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 CFR 122.44(d)(1)(vi).

Several specific factors affecting the development of limitations and requirements in this Order are discussed as follows.

A. Discharge Prohibitions

1. **Discharge Prohibitions III.A (No discharge other than that described in this Order):** This prohibition is the same as in the previous permit and is based on CWC section 13260, which requires filing a Report of Waste Discharge before discharges can occur. Discharges not described in the,Report of Waste Discharge and subsequently in the Order, are prohibited.

2. **Discharge Prohibition III.B. (average dry weather flow not to exceed dry weather design capacity):** This prohibition is based on the historic and tested reliable treatment capacity of the wastewater treatment facility. Exceedance of the treatment plant's average dry weather flow design capacity of 5.5 mgd may result in lowering the reliability of achieving compliance with water quality requirements.

3. **Discharge Prohibitions III.C (No discharge receiving less than 10:1 dilution):** This prohibition is the same as in the previous permit and is based on Discharge Prohibition No. 1 from Table 4-1 of the Basin Plan, which prohibits discharges that do not receive a minimum 10:1 initial dilution. Further, this Order allows a 10:1 dilution credit in the calculation of some WQBELs, and these limits would not be protective of water quality, if the discharge did not actually achieve a 10:1 minimum initial dilution.

4. **Discharge Prohibition III.D. (No bypasses except under the conditions at 40 CFR 122.41(m)(4)(i)(A), (B), and (C)):** This prohibition grants bypass of peak wet weather flows above 13 MGD when recombined with secondary treatment flows and discharged at the combined outfall in accordance with the conditions at 40 CFR 122.41(m)(4)(i)(A)-(C).

   Background
   During significant storm events, high influent flows can overwhelm certain parts of the wastewater treatment process and may cause damage or failure of the system. Operators of wastewater treatment plants must manage these high flows to both ensure the continued operation of the treatment process and to prevent backups and overflows of raw wastewater in basements or on city streets. USEPA recognizes that peak wet weather flow diversions around secondary treatment units (blending) at POTW treatment plants serving separate sanitary sewer conveyance systems may be necessary in some circumstances.

In December 2005, USEPA invited public comment on a proposed Peak Wet Weather Policy that interprets 40 CFR 122.41(m) to apply to wet weather diversions recombined with flow from secondary treatment, and provides guidance, regarding when the Regional Water Board may approved blending in an NPDES permit. The draft policy requires that dischargers must meet all the requirements of NPDES permits, and encourages municipalities to make investments in ongoing maintenance and capital improvements to improve their system's long-term performance. While USPEA has not formally adopted the draft policy, the proposal is a useful tool for Regional Water Board consideration.

Criteria of 40 CFR 122.41(m)(4)(i)(A)-(C)

If the criteria of 40 CFR 122.41(m)(4)(i)(A)-(C) are met, the Regional Water Board can approve wet weather diversions that are recombined with flow from secondary treatment. The criteria of 40 CFR 122.41(m)(4)(i) (Federal Standard Provisions, Attachment D) are (A) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; (B) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime; and (C) the Discharger submitted notice to the Regional Water Board as required under Federal Standard Provision – Permit Compliance I.G.5.

On February 14, 2007, the Discharger submitted a No Feasible Alternatives Analysis that addresses measures it has taken and plans to take to reduce and eliminate bypasses during peak wet weather events so that such bypasses could be approved pursuant to 40 CFR 122.41(m)(4). During the past several years, the Discharger has undertaken sewer system improvements that have reduced the volume of storm flows to the treatment plant. The Discharger has also installed a Supervisory Control And Data Acquisition (SCADA) system to allow better control and management of storm flows in the collection system. While limited space is available to expand treatment capacity at the plant location, the Discharger is planning to construct a 660,000 gallon retention basin to further reduce the need for blending. The Discharger has also proposed the following actions, which are required by Provision VI.C.7:

- Use an empty aeration basin as-needed during wet weather events
- Acquire second combination sewer cleaning truck
- Acquire new sewer TV system vehicle
- Rehabilitate or replace sewers in poor condition and sewers that require frequent maintenance
- Implement identified controls to reduce return of water back to facility headworks

The Discharger has satisfied the criteria of 40 CFR 122.41(m)(4)(i)(A-C). Bypasses are necessary to prevent severe property damage when flows exceed the capacity of the secondary treatment. The Discharger has analyzed alternatives to bypassing and has determined that no feasible alternative exists at this time. The Discharger

has submitted notice to the Regional Water Board as required under Federal Standard Provision – Permit Compliance I.G.5.

5. **Discharge Prohibition III. E (No sanitary sewer overflows to waters of the United States).** The Discharge Prohibition No. 15 from Table 4-1 of the Basin Plan, and the CWA prohibit the discharge of wastewater to surface waters except as authorized under an NPDES permit. POTWs must achieve secondary treatment, at a minimum, and any more stringent limitations that are necessary to achieve water quality standards. [33 U.S.C. § 1311 (b)(1)(B and C)] Therefore, a sanitary sewer overflow that results in the discharge of raw sewage, or sewage not meeting secondary treatment requirements, to surface waters is prohibited under the CWA and the Basin Plan.

B. Technology-based Effluent Limitations

1. Scope and Authority

The Code of Federal Regulations (CFR) at 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards. This Order includes technology-based effluent limitations based on Secondary Treatment Standards at 40 CFR §133. Permit effluent limitations for conventional pollutants are technology-based. Technology-based effluent limitations are put in place to ensure that full secondary treatment is achieved by the wastewater treatment facility, as required under 40 CFR §133.102. Effluent limitations for these conventional pollutants are defined by the Basin Plan, Table 4-2. Further, these conventional effluent limits are the same as those from the previous permit for the following constituents, except settleable solids, which is no longer required.

- Biochemical Oxygen Demand (BOD),
- BOD percent removal,
- Total suspended solids (TSS),
- TSS percent removal,
- pH,
- Oil and grease, and
- Total chlorine residual.

2. Applicable Technology-Based Effluent Limitations

The Order retains the following technology based effluent limitations, applicable to Monitoring Location E-001, from Order No. R2-2002-0027. The effluent limitation for chlorine residual applies to Discharge Point E-002.

Table F-8. Summary of Technology-based Effluent Limitations

Parameter[a]	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Monitoring Location E-001						
$BOD_{5\text{-day}}$[b]	mg/L	30	45	--	--	--
TSS[b]	mg/L	30	45	--	--	--
Oil and Grease[c]	mg/L	10	--	20	--	--
pH[d]	standard units	--	--	--	6.0	9.0
Discharge Point E-002						
Total Chlorine Residual[e]	mg/L	--	--	--	--	0.0

a) The technology based effluent limitations for settleable matter are not retained from Order No. R2-2002-0027, as the Regional Water Board has determined that compliance with the Secondary Treatment Regulation at 40 CFR 133 and with the Basin Plan (Table 4-2) requirements for all discharges to inland surface waters and enclosed bays and estuaries of the Region will ensure removal of settleable solids to acceptably low levels – below 0.1 ml/L/hr (30 day average) and 0.2 ml/L/hr (daily maximum).

b) The maximum daily limitations (MDELs) for BOD and TSS are retained from the previous Order. 40 CFR 122.45(d)(2) specifies that discharge limitations for POTWs shall be stated as average weekly limitations and average monthly limitations, unless impracticable.

c) The limitations established for oil and grease are levels attainable by secondary treatment and are required by the Basin Plan (Table 4-2) for all discharges to inland surface waters and enclosed bays and estuaries of the Region.

d) The pH limitation is retained from the previous Order and is required by USEPA's Secondary Treatment Regulation at 40 CFR 133 and by the Basin Plan (Table 4-2) for deep water discharges.

e) The effluent limitation for total residual chlorine is unchanged from the previous permit and is based on the Basin Plan (Chapter 4, Table 4-2).

3. Bacteria

The Basin Plan, Table 4.2, establishes effluent limitations for total coliform bacteria for all discharges from sewage treatment facilities to inland surface waters and enclosed bays and estuaries of the Region. Fecal coliform limitations may be substituted for the limitations of the Basin Plan "provided it can be conclusively demonstrated through a program approved by the Regional Water Board that such substitution will not result in unacceptable adverse impacts on the beneficial uses of the receiving water." Following receiving water impact monitoring studies conducted since 1992, the Regional Water Board amended the Discharger's NPDES permit with Order No. 98-117.

Order No. 98-117 amended Waste Discharge Requirements for permittees discharging treated effluent through the NBSU, to allow fecal coliform limitations to be substituted for total coliform limitations. The finding relied on previous studies, including the City of San Mateo and SBSA's 1997 fecal coliform studies that showed no relationship between dischargers' effluent fecal coliform concentrations and the shoreline concentrations. No impact from these two outfalls on the south Foster City shellfish harvesting beds was found. The San Mateo outfall is ¾ mile from the shellfish harvesting beds and the SBSA outfall is approximately two miles away.

Since the NBSU outfall is 6.5 miles from the shellfish harvesting beds, it is even less likely to impact those shellfish beds. Order No. 98-117 identified that there is, however, water contact recreation (board surfing) in the vicinity of the NBSU outfall. Thus effluent limits are set to meet water contact recreation objectives, which will also be protective of shellfish harvesting. These are a geometric mean fecal coliform density based on 5 consecutive samples within a 30-day period effluent limitation of 200 MPN/100ml and a 90th percentile fecal coliform effluent limitation of 400 MPN/100ml.

Additionally, enterococci bacteria are more closely associated with gastrointestinal disease than fecal coliform bacteria for water contact. Pursuant to the BEACH Act of 2000, USEPA has promulgated enterococci bacteria criteria for water contact recreation in coastal waters that apply to this discharge. The limit for enterococci bacteria established by this Order (geometric mean not to exceed 35 colonies per 100 milliliters) is based on water quality criteria established by the USEPA at 40 CFR131.41 for coastal recreation waters, including coastal estuaries, in California. These water quality criteria became effective on December 16, 2004. [69 Fed Reg. 67218 (November 16, 2004)].

Although USEPA also established single sample maximum criteria for enterococci bacteria, this Order implements only the geometric mean criterion of 35 colonies per 100 milliliters as an effluent limitation. When these water quality criteria were promulgated, USEPA expected that the single sample maximum values would be used for making beach notification and beach closure decisions. "Other than in the beach notification and closure decision context, the geometric mean is the more relevant value for assuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure, being less subject to random variation ...." [69 Fed Reg. 67224 (November 16, 2004)]

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

a. NPDES regulations at 40 CFR 122.44(d)(1)(i) require permits to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard (reasonable potential). The process for determining reasonable potential and calculating WQBELs, when necessary, is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in the CTR, NTR, Basin Plan, other State plans and policies.

b. NPDES regulations and the SIP provide the basis to establish Maximum Daily Effluent Limitations (MDELs).

1) NPDES Regulations. NPDES regulations at 40 CFR Part 122.45(d) state: "For continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards,

shall *unless impracticable* be stated as maximum daily and average monthly discharge limitations for all discharges other than publicly owned treatment works."

2) **SIP.** The SIP (page 8, Section 1.4) requires WQBELs be expressed as MDELs and average monthly effluent limitations (AMELs).

c. MDELs are used in this Order to protect against acute water quality effects. The MDELs are necessary for preventing fish kills or mortality to aquatic organisms.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

The WQC and WQOs applicable to the receiving waters for this discharge are from the Basin Plan; the CTR, established by USEPA at 40 CFR 131.38; and the NTR, established by USEPA at 40 CFR 131.36. Some pollutants have WQC/WQOs established by more than one of these three sources.

a. **Basin Plan.** The Basin Plan specifies numeric WQOs for 10 priority toxic pollutants, as well as narrative WQOs for toxicity and bioaccumulation in order to protect beneficial uses. The pollutants for which the Basin Plan specifies numeric objectives are arsenic, cadmium, chromium (VI), copper in freshwater, lead, mercury, nickel, silver, zinc, and cyanide. The narrative toxicity objective states, in part, "[a]ll waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms." The bioaccumulation objective states in part, "[c]ontrollable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered." Effluent limitations and provisions contained in this Order are designed, based on available information, to implement these objectives.

b. **CTR.** The CTR specifies numeric aquatic life criteria for 23 priority toxic pollutants and numeric human health criteria for 57 priority toxic pollutants. These criteria apply to all inland surface waters and enclosed bays and estuaries of the San Francisco Bay Region, although Tables 3-3 and 3-4 of the Basin Plan include numeric objectives for certain of these priority toxic pollutants, which supersede criteria of the CTR (except in the South Bay south of the Dumbarton Bridge).

c. **NTR.** The NTR establishes numeric aquatic life criteria for selenium, numeric aquatic life and human health criteria for cyanide, and numeric human health criteria for 34 toxic organic pollutants for waters of San Francisco Bay upstream to, and including Suisun Bay and the Delta. These criteria of the NTR are applicable to the Lower San Francisco Bay, the receiving water for this Discharger.

d. **Technical Support Document for Water Quality-Based Toxics Controls.** Where numeric objectives have not been established or updated in the Basin Plan, NPDES regulations at 40 CFR Part 122.44(d) require that WQBELs be

established based on USEPA criteria, supplemented where necessary by other relevant information, to attain and maintain narrative WQOs to fully protect designated beneficial uses.

To determine the need for and establish WQBELs, when necessary, the Regional Water Board staff has followed the requirements of applicable NPDES regulations, including 40 CFR Parts 122 and 131, as well as guidance and requirements established by the Basin Plan; USEPA's *Technical Support Document for Water Quality-Based Toxics Control* (TSD, EPA/505/2-90-001, 1991); and the State Water Board's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP, 2005).

e. **Basin Plan Receiving Water Salinity Policy.** The Basin Plan (like the CTR and the NTR) states that the salinity characteristics (i.e., freshwater vs. saltwater) of the receiving water shall be considered in determining the applicable WQC. Freshwater criteria shall apply to discharges to waters with salinities equal to or less than one ppt at least 95 percent of the time. Saltwater criteria shall apply to discharges to waters with salinities equal to or greater than 10 ppt at least 95 percent of the time in a normal water year. For discharges to water with salinities in between these two categories, or tidally influenced freshwaters that support estuarine beneficial uses, the criteria shall be the lower of the salt or freshwater criteria (the latter calculated based on ambient hardness) for each substance.

   The receiving water for this discharger, Lower San Francisco Bay is within the South Bay Basin Watershed of the Region, which is a saltwater environment based on salinity data generated through the Regional Monitoring Program (RMP) at the San Bruno Shoal (BB15), Alameda (BB70), and Oyster Point (BB30) sampling stations between 1993 and 2001. In that period, the average salinity at the three sampling stations was 23 - 24 ppt; and the minimum observed salinity levels at the San Bruno Shoal, Alameda, and Oyster Point sampling stations were 12, 11, and 0.5 ppt, respectively. As salinity was greater than 10 ppt in at least 95 percent of receiving water samples, the saltwater criteria from the Basin Plan, NTR, and CTR are applicable to this discharge.

f. **Site-Specific Metals Translators.** Because NPDES regulations at 40 CFR 122.45(c) require effluent limitations for metals to be expressed as total recoverable metal, and applicable water quality criteria for the metals are typically expressed as dissolved metal, factors or translators must be used to convert metals concentrations from dissolved to total recoverable and vice versa. In the CTR, USEPA establishes default translators to be used in NPDES permitting activities; however, site-specific conditions such as water temperature, pH, suspended solids, and organic carbon, greatly impact the form of metal (dissolved, filterable, or otherwise) present and therefore available in the water to cause toxicity. In general, the dissolved form of the metals is more available and more toxic to aquatic life than filterable forms. Site-specific translators can be developed to account for site-specific conditions, thereby preventing exceedingly stringent or under-protective WQOs.

For deep water discharges to Lower San Francisco Bay, the following translators are used for copper and nickel, based on recommendations of the Clean Estuary Partnership's *North of Dumbarton Bridge Copper and Nickel Development and Selection of Final Translators* (2005). In determining the need for WQBELs and calculating WQBELs for all other metals, default translators established by the USEPA in the CTR at 40 CFR 131.38(b)(2), Table 2, are used.

CU and Ni Translators for Deepwater Discharges to Lower San Francisco Bay	Copper		Nickel	
	AMEL Translator	MDEL Translator	AMEL Translator	MDEL Translator
	0.74	0.88	0.65	0.85

3. Determining the Need for WQBELs

NPDES regulations at 40 CFR 122.44(d)(1)(i) require permits to include WQBELs for all pollutants (non-priority or priority) "which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any narrative or numeric criteria within a State water quality standard" (have reasonable potential). Thus, assessing whether a pollutant has reasonable potential is the fundamental step in determining whether or not a WQBEL is required. For non-priority pollutants, Regional Water Board staff used available monitoring data, the receiving water's designated uses, and/or previous permit pollutant limitations to determine reasonable potential. For priority pollutants, Regional Water Board staff used the methods prescribed in Section 1.3 of the SIP to determine if the discharge from the Facility demonstrates reasonable potential.

a. Reasonable Potential Analysis

Using the methods prescribed in Section 1.3 of the SIP, Regional Water Board staff analyzed the effluent data to determine if the discharge from the Facility demonstrates reasonable potential. The Reasonable Potential Analysis (RPA) compares the effluent data with numeric and narrative WQOs in the Basin Plan and numeric WQC from the USEPA, the NTR, and the CTR. The Basin Plan objectives and CTR criteria are shown in Appendix A of this Fact Sheet.

b. Reasonable Potential Methodology

Using the methods and procedures prescribed in Section 1.3 of the SIP, Regional Water Board staff analyzed the effluent and background data and the nature of facility operations to determine if the discharge has reasonable potential to cause or contribute to exceedances of applicable water quality objectives (WQOs) or water quality criteria (WQC). Appendix A of this Fact Sheet shows the stepwise process described in Section 1.3 of the SIP.

The RPA projects a maximum effluent concentration (MEC) for each pollutant based on existing data, while accounting for a limited data set and effluent variability. There are three triggers in determining reasonable potential.

(1) The first WQC trigger is activated if the MEC is greater than the lowest applicable WQO (MEC ≥ WQO/WQC), which has been adjusted, if appropriate, for pH, hardness, and translator data. If the MEC is greater than the adjusted WQO, then that pollutant has reasonable potential, and a WQBEL is required.

(2) The second trigger is activated if the observed maximum ambient background concentration (B) is greater than the adjusted WQO/WQC (B > WQO/WQC), and the pollutant is detected in any of the effluent samples (MEC > ND).

(3) The third trigger is activated if a review of other information determines that a WQBEL is required to protect beneficial uses, even though both MEC and B are less than the WQO/WQC. A limitation may be required under certain circumstances to protect beneficial uses.

c. Effluent Data

The Regional Water Board's August 6, 2001 letter titled *Requirement for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy* (hereinafter referred to as the August 6, 2001 Letter—available online; see Standard Language and Other References Available Online, below) to all permittees, formally required the Discharger (pursuant to Section 13267 of the CWC) to initiate or continue effluent monitoring for the priority pollutants using analytical methods that provide the best detection limits reasonably feasible. Regional Water Board staff analyzed these effluent data and the nature of the Facility to determine if the discharge has reasonable potential. The RPA was based on the effluent monitoring data collected by the Discharger from October 2003 through September 2006 for most inorganic pollutants, and from January 2002 through February 2006 for most organic pollutants.

d. Ambient Background Data

Ambient background values are used in the RPA and in the calculation of effluent limitations. For the RPA, ambient background concentrations are the observed maximum detected water column concentrations. The SIP states that for calculating WQBELs ambient background concentrations are either the observed maximum ambient water column concentrations or, for WQO/WQC intended to protect human health from carcinogenic effects, the arithmetic mean of observed ambient water concentrations. The RMP station at Yerba Buena Island, located in the Central Bay, has been monitored for most of the inorganic toxic pollutants (CTR constituent numbers 1–15) and some of the organic toxic pollutants (CTR constituent numbers 16–126), and these data from the RMP were used as background data in performing the RPA.

Not all the constituents listed in the CTR have been analyzed by the RMP. These data gaps are addressed by the August 6, 2001 Letter, which formally required Dischargers (pursuant to Section 13267 of the CWC) to conduct

ambient background monitoring for those constituents not currently monitored by the RMP and to provide this technical information to the Regional Water Board.

On May 15, 2003, a group of several San Francisco Bay Region Dischargers (known as the Bay Area Clean Water Agencies, or BACWA) submitted a collaborative receiving water study, entitled the *San Francisco Bay Ambient Water Monitoring Interim Report.* This study includes monitoring results from sampling events in 2002 and 2003 for the remaining priority pollutants not monitored by the RMP. The RPA was conducted and the WQBELs were calculated using RMP data from 1993 through 2003 for inorganics and organics at the Yerba Buena Island RMP station, and additional data from the BACWA *Ambient Water Monitoring: Final CTR Sampling Update Report* for the Yerba Buena Island RMP station.

e. RPA Determination

The MECs, most stringent applicable WQOs/WQC, and background concentrations used in the RPA are presented in the following table, along with the RPA results (yes or no) for each pollutant analyzed. Reasonable potential was not determined for all pollutants, as there are not applicable WQOs/WQC for all pollutants, and monitoring data were not available for others. More details regarding the RPA are included in Appendix A of this Fact Sheet. The pollutants that exhibit reasonable potential are copper, cyanide, and dioxin-TEQ.

Table F-9. Reasonable Potential Analysis Summary

CTR #	Priority Pollutants	MEC or Minimum DL [a][b] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background or Minimum DL [a][b] (µg/L)	RPA Results[c]
1	Antimony	**1.5**	4300	1.8	No
2	Arsenic	**2.1**	36	2.46	No
3	Beryllium	< 0.06	No Criteria	0.215	Ud
4	Cadmium	**0.06**	9.4	0.13	No
5a	Chromium (III)	Not Available	No Criteria	Not Available	Ud
5b	Chromium (VI)	**1.3**	50	4.4	No
6	Copper	**12**	4.2	2.55	**Yes**
7	Lead	**0.73**	8.5	0.80	No
8	Mercury (303d listed)	**0.015**	0.025	0.0086	No
9	Nickel	**6.1**	12.6	3.7	No
10	Selenium	**2.0**	5	0.39	No
11	Silver	**2.1**	2.2	0.052	No
12	Thallium	Not Available	6.3	0.21	Ud
13	Zinc	**45**	86	5.1	No
14	Cyanide	**26**	1.0	< 0.4	**Yes**
15	Asbestos	Not Available	No Criteria	Not Available	Ud
16	2,3,7,8-TCDD (303d listed)	< 6.37E-07	1.4E-08	Not Available	No
16-TEQ	Dioxin TEQ (303d listed)	**1.44E-09 (estimated DNQ)**	1.4E-08	7.10E-08	**Yes**
17	Acrolein	< 0.56	780	< 0.5	No
18	Acrylonitrile	< 0.33	0.66	0.03	No
19	Benzene	**1.0**	71	< 0.05	No

CTR #	Priority Pollutants	MEC or Minimum DL [a][b] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background or Minimum DL [a][b] (µg/L)	RPA Results[c]
20	Bromoform	**0.09**	360	< 0.5	No
21	Carbon Tetrachloride	< 0.06	4.4	0.06	No
22	Chlorobenzene	< 0.06	21000	< 0.5	No
23	Chlorodibromomethane	**0.3**	34	< 0.05	No
24	Chloroethane	< 0.07	No Criteria	< 0.5	Ud
25	2-Chloroethylvinyl ether	< 0.1	No Criteria	< 0.5	Ud
26	Chloroform	**5.6**	No Criteria	< 0.5	Ud
27	Dichlorobromomethane	**0.8**	46	< 0.05	No
28	1,1-Dichloroethane	**3.7**	No Criteria	< 0.05	Ud
29	1,2-Dichloroethane	**1.3**	99	0.04	No
30	1,1-Dichloroethylene	< 0.06	3.2	< 0.5	No
31	1,2-Dichloropropane	**0.5**	39	< 0.05	No
32	1,3-Dichloropropylene	< 0.05	1700	Not Available	No
33	Ethylbenzene	**1.3**	29000	< 0.5	No
34	Methyl Bromide	< 0.05	4000	< 0.5	No
35	Methyl Chloride	<0.04	No Criteria	< 0.5	Ud
36	Methylene Chloride	**8.7**	1600	0.5	No
37	1,1,2,2-Tetrachloroethane	< 0.06	11	< 0.05	No
38	Tetrachloroethylene	**1.7**	8.9	< 0.5	No
39	Toluene	**28**	200000	< 0.3	No
40	1,2-Trans-Dichloroethylene	< 0.05	140000	< 0.5	No
41	1,1,1-Trichloroethane	< 0.06	No Criteria	< 0.5	Ud
42	1,1,2-Trichloroethane	< 0.07	42	< 0.05	No
43	Trichloroethylene	**0.8**	81	< 0.5	No
44	Vinyl Chloride	< 0.05	525	< 0.5	No
45	2-Chlorophenol	< 0.4	400	< 1.2	No
46	2,4-Dichlorophenol	< 0.3	790	< 1.3	No
47	2,4-Dimethylphenol	< 0.9	2300	< 1.3	No
48	2-Methyl- 4,6-Dinitrophenol	< 0.4	765	< 1.2	No
49	2,4-Dinitrophenol	< 0.3	14000	< 0.7	No
50	2-Nitrophenol	< 0.3	No Criteria	< 1.3	Ud
51	4-Nitrophenol	< 0.2	No Criteria	< 1.6	Ud
52	3-Methyl 4-Chlorophenol	< 0.5	No Criteria	< 1.1	Ud
53	Pentachlorophenol	< 0.4	7.9	< 1.0	No
54	Phenol	<0.005	4600000	< 1.3	No
55	2,4,6-Trichlorophenol	< 0.2	6.5	< 1.3	No
56	Acenaphthene	< 0.17	2700	0.0015	No
57	Acenaphthylene	< 0.03	No Criteria	0.00053	Ud
58	Anthracene	< 0.16	110000	0.0005	No
59	Benzidine	< 0.6	0.00054	< 0.0015	No
60	Benzo(a)Anthracene	Not Available	0.049	0.0053	Ud
61	Benzo(a)Pyrene	< 0.09	0.049	0.00029	No
62	Benzo(b)Fluoranthene	< 0.11	0.049	0.0046	No
63	Benzo(ghi)Perylene	Not Available	No Criteria	0.0027	Ud
64	Benzo(k)Fluoranthene	< 0.16	0.049	0.0015	No
65	Bis(2-Chloroethoxy)Methane	< 0.5	No Criteria	< 0.3	Ud
66	Bis(2-Chloroethyl)Ether	< 0.6	1.4	< 0.3	No
67	Bis(2-Chloroisopropyl)Ether	< 0.3	170000	Not Available	No

CTR #	Priority Pollutants	MEC or Minimum DL [a][b] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background or Minimum DL [a][b] (µg/L)	RPA Results[c]
68	Bis(2-Ethylhexyl)Phthalate	**1.8**	5.9	< 0.5	No
69	4-Bromophenyl Phenyl Ether	< 0.4	No Criteria	< 0.23	Ud
70	Butylbenzyl Phthalate	< 0.4	5200	< 0.52	No
71	2-Chloronaphthalene	< 0.3	4300	< 0.3	No
72	4-Chlorophenyl Phenyl Ether	< 0.4	No Criteria	< 0.3	Ud
73	Chrysene	< 0.14	0.049	0.0024	No
74	Dibenzo(a,h)Anthracene	< 0.04	0.049	0.00064	No
75	1,2-Dichlorobenzene	**0.07**	17000	< 0.8	No
76	1,3-Dichlorobenzene	< 0.07	2600	< 0.8	No
77	1,4-Dichlorobenzene	**0.4**	2600	< 0.8	No
78	3,3 Dichlorobenzidine	< 0.2	0.077	< 0.001	No
79	Diethyl Phthalate	< 0.5	120000	< 0.24	No
80	Dimethyl Phthalate	< 0.5	2900000	< 0.24	No
81	Di-n-Butyl Phthalate	< 0.4	12000	< 0.5	No
82	2,4-Dinitrotoluene	< 0.3	9.1	< 0.27	No
83	2,6-Dinitrotoluene	< 0.3	No Criteria	< 0.29	Ud
84	Di-n-Octyl Phthalate	< 0.4	No Criteria	< 0.38	Ud
85	1,2-Diphenylhydrazine	< 0.6	0.54	0.0037	No
86	Fluoranthene	< 0.03	370	0.011	No
87	Fluorene	< 0.02	14000	0.00208	No
88	Hexachlorobenzene	< 0.4	0.00077	0.0000202	No
89	Hexachlorobutadiene	< 0.3	50	< 0.3	No
90	Hexachlorocyclopentadiene	< 0.1	17000	< 0.31	No
91	Hexachloroethane	< 0.6	8.9	< 0.2	No
92	Indeno(1,2,3-cd)Pyrene	< 0.04	0.049	0.004	No
93	Isophorone	< 0.5	600	< 0.3	No
94	Naphthalene	< 0.05	No Criteria	0.0023	Ud
95	Nitrobenzene	< 0.7	1900	< 0.25	No
96	N-Nitrosodimethylamine	< 0.6	8.1	< 0.3	No
97	N-Nitrosodi-n-Propylamine	< 0.3	1.4	< 0.001	No
98	N-Nitrosodiphenylamine	< 0.5	16	< 0.001	No
99	Phenanthrene	< 0.03	No Criteria	0.0061	Ud
100	Pyrene	< 0.03	11000	0.0051	No
101	1,2,4-Trichlorobenzene	< 0.6	No Criteria	< 0.3	Ud
102	Aldrin	< 0.002	0.00014	Not Available	No
103	alpha-BHC	**0.004**	0.013	0.000496	No
104	beta-BHC	< 0.001	0.046	0.000413	No
105	gamma-BHC	< 0.001	0.063	0.0007034	No
106	delta-BHC	< 0.001	No Criteria	0.000042	Ud
107	Chlordane (303d listed)	< 0.005	0.00059	0.00018	No
108	4,4'-DDT (303d listed)	< 0.001	0.00059	0.000066	No
109	4,4'-DDE (linked to DDT)	<0.001	0.00059	0.000693	No
110	4,4'-DDD	< 0.001	0.00084	0.000313	No
111	Dieldrin (303d listed)	< 0.002	0.00014	0.000264	No
112	alpha-Endosulfan	< 0.002	0.0087	0.000031	No
113	beta-Endolsulfan	< 0.001	0.0087	0.000069	No
114	Endosulfan Sulfate	< 0.001	240	0.0000819	No
115	Endrin	< 0.002	0.0023	0.000036	No

CTR #	Priority Pollutants	MEC or Minimum DL [a][b] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background or Minimum DL [a][b] (µg/L)	RPA Results[c]
116	Endrin Aldehyde	< 0.002	0.81	Not Available	No
117	Heptachlor	< 0.003	0.00021	0.000019	No
118	Heptachlor Epoxide	< 0.002	0.00011	0.00002458	No
119-125	PCBs sum (303d listed)	< 0.3	0.00017	Not Available	No
126	Toxaphene	< 0.15	0.00020	Not Available	No
	Tributylin	Not Available	0.01	< 0.001	Ud
	Total PAHs	Not Available	15	0.26	Ud

[a] The Maximum Effluent Concentration (MEC) or maximum background concentration is the actual detected concentration unless there is a "<" sign before it, in which case the value shown is the minimum detection level.
[b] The MEC or maximum background concentration is "Not Available" when there are no monitoring data for the constituent.
[c] RPA Results = Yes, if MEC > WQO/WQC, or B > WQO/WQC and MEC is detected;
= No, if MEC and B are < WQO/WQC or all effluent data are undetected;
= Undetermined (Ud), if no criteria have been promulgated or no effluent data are available.

(1) Constituents with limited data. The Discharger has performed sampling and analysis for the constituents listed in the CTR. This data set was used to perform the RPA. In some cases, reasonable potential cannot be determined because effluent data are limited, or ambient background concentrations are not available. The Discharger will continue to monitor for these constituents in the effluent using analytical methods that provide the best feasible detection limits. When additional data become available, further analysis will be conducted to determine whether to add numeric effluent limitations or to continue monitoring.

(2) Pollutants with no Reasonable Potential. WQBELs are not included in this Order for constituents that do not demonstrate reasonable potential; however, monitoring for those pollutants is still required. As required by Provision VI.C.2.a, if concentrations of these constituents are found to have increased significantly, the Discharger will be required to investigate the source(s) of the increase(s). Remedial measures are required if the increases pose a threat to water quality in the receiving water.

4. WQBEL Calculations

a. Pollutants with Reasonable Potential

WQBELs were developed for the toxic and priority pollutants that were determined to have reasonable potential to cause or contribute to exceedances of the WQOs or WQC. The WQBELs were calculated based on appropriate WQOs/WQC and the appropriate procedures specified in Section 1.4 of the SIP. The WQOs or WQC used for each pollutant with reasonable potential and the basis for the WQOs/WQC is indicated in the following table.

Table F-10. Water Quality Criteria/Objectives for Toxics

Pollutant	Water Quality Criterion or Objective (µg/L)			Basis
	Aquatic Life Chronic	Aquatic Life Acute	Human Health	
Copper	4.2	5.5	---	Basin Plan (salt water aquatic life)
Cyanide	1.0	1.0	---	NTR criteria for the Bay
Dioxin-TEQ	---	---	1.4×10^{-8}	Basin Plan narrative for human health
Total Ammonia as N[1]	0.94	10.79	---	Basin Plan (salt water aquatic life)

[1] The Basin Plan un-ionized WQOs were translated to total ammonia WQOs as described in Section 4.d.4 of this Fact Sheet.

b. Dilution Credit

The SIP provides the basis for dilution credits. The NBSU outfall is designed to achieve a minimum initial dilution of 10:1. Based on review of RMP monitoring data for the Bay, there is variability in the receiving water, and the hydrology of the receiving water is, itself, very complex. Therefore, there is uncertainty regarding the representative nature of ambient background data, which is used for determination of effluent limitations. Pursuant to section 1.4.2.1 of the SIP, "dilution credit may be limited or denied on a pollutant-by-pollutant basis...." The Regional Water Board has determined that a conservative 10:1 dilution credit for non-bioaccumulative priority pollutants (except for ammonia and cyanide) and a zero dilution credit for bioaccumulative pollutants are necessary for protection of beneficial uses. The detailed basis for each are explained below.

(1) For certain bioaccumulative pollutants, based on BPJ, dilution credit is not included in calculating the final WQBELs. This determination is based on available data on concentrations of these pollutants in aquatic organisms, sediment, and the water column. The Clean Water Act 303(d) list was updated and approved by the Regional Water Board on October 25, 2006. The USEPA added dioxin and furan compounds for Lower San Francisco Bay. The reason for this decision is based on the following factors that suggest there is no more assimilative capacity in the Bay for dioxins and furans.

Samples of tissue taken from fish in the San Francisco Bay show the presence of these pollutants at concentrations greater than screening levels. (*Contaminant Concentrations in Fish from San Francisco Bay*, May 1997). The Office of Environmental Health and Hazard Assessment (OEHHA) also

completed a preliminary review of data in the 1994 San Francisco Bay pilot study, *Contaminated Levels in Fish Tissue from San Francisco Bay*. The results of the study also showed elevated levels of chemical contaminants in fish tissues. In December 1994, OEHHA subsequently issued an interim consumption advisory covering certain fish species in the Bay. This advisory is still in effect for exposure to sport fish that are found to be contaminated with dioxins and furans, and other pollutants.

(2) Section 2.1.1 of the SIP states that for bioaccumulative compounds on the 303(d) list, the Regional Water Board should consider whether mass-loading limits should be limited to current levels. The Regional Water Board finds that mass-loading limits are warranted for mercury for the receiving waters of this Discharger. This is to ensure that this Discharger does not contribute further to impairment of the narrative objective for bioaccumulation.

(3) For non-bioaccumulative constituents, except ammonia and cyanide, a conservative allowance of 10:1 dilution for discharges to San Francisco Bay has been assigned for protection of beneficial uses. The 10:1 dilution allowance was granted in the previous Order and is also based on the Basin Plan's Prohibition Number 1 from Table 4-1, which prohibits discharges with less than 10:1 dilution. Limiting the dilution credit is allowed based on SIP provisions in Section 1.4.2. The dilution credit is also based on SIP section 1.4.2, which considers the following:

(a) A far-field background station is appropriate because the receiving water body (the Bay) is a very complex estuarine system with highly variable and seasonal upstream freshwater inflows and diurnal tidal saltwater inputs. The SIP allows background conditions to be determined on a discharge-by-discharge or water body-by-water body basis (SIP section 1.4.3). Consistent with the SIP, Regional Water Board staff has chosen to use a water body-by-water body basis due to inherent uncertainties in characterizing ambient background conditions in a complex estuarine system on a discharge-by-discharge basis.

The Yerba Buena Island RMP monitoring station, relative to other RMP stations, fits the guidance criteria of the SIP for establishing background conditions. The SIP requires that background water quality data be representative of the ambient receiving water that will mix with the discharge. Regional Water Board staff believes that water quality data from the Yerba Buena Island monitoring station is representative of the water that will mix with discharges from the Facility/NBSU Outfall.

(b) Because of the complex hydrology of the San Francisco Bay, a mixing zone has not been established. There are uncertainties in accurately determining the mixing zones for each discharge. The models that have been used to predict dilution have not considered the three dimensional nature of the currents in the Estuary resulting from the interaction of tidal flushes and seasonal fresh water outflows. Being heavier and colder than fresh water, ocean salt water enters San Francisco Bay on a twice per day

tidal cycle, generally beneath the warmer fresh water that flows seaward during wet seasons. When these waters mix and interact, complex circulation patterns occur due to varying densities of fresh and ocean waters. The locations of this mixing and interaction change, depending on the strength of each tide and rate of delta outflow. Additionally, sediment loads to the Bay from the Central Valley change on a longer term basis, affecting the depth of different parts of the Bay and resulting in alteration of flow patterns and mixing and dilution that is achieved at an outfall.

(c) The SIP allows limiting a mixing zone and dilution credit for persistent pollutants. Discharges to the Bay are defined by the SIP as incompletely mixed discharges; therefore, dilution credit should be determined using site specific information. Section 1.4.2.2 of the SIP specifies that the Regional Water Board shall "significantly limit a mixing zone and dilution credit as necessary to protect beneficial uses .... For example, in determining the extent of a mixing zone or dilution credit, the Regional Water Board shall consider the presence of pollutants in the discharge that are ... persistent." The SIP defines persistent pollutants as "substances for which degradation or decomposition in the environment is nonexistent or very slow." The pollutants at issue here are persistent pollutants (e.g., copper). Dilution studies that estimate actual dilution do not address the effects of these persistent pollutants in the Bay environment, including long term effects on sediment concentrations.

(4) For ammonia, a non-persistent pollutant, estimated actual initial dilution levels have been used to calculate the effluent limit. This is justified because ammonia is quickly dispersed and degraded to a non-toxic state very rapidly. An engineering study on the actual dilution was performed by the Airfield Development Engineering Consultant on behalf of the NBSU and submitted on December 12, 2000. This was part of a larger study to estimate hydrodynamic impacts on the Bay by the proposed runway extension.

The discharge is pumped through a 60" pipe to a 654-ft diffuser section located approximately 5,200 ft offshore, at a depth 20 feet below mean lower low water, from Pt. San Bruno. The diffuser consists of 66 three-inch openings spaced 7-ft apart. At a point in the immediate vicinity of the diffuser, a 74:1 instant dilution was calculated using the CORMIX model to estimate mixing of the effluent under tidal conditions. Dilution rates at other points were estimated. At a point approximately 1.5 km from the diffuser into the Bay (to the east), a dilution of 270:1 was estimated. In calculating the water quality based effluent limits (maximum daily and average monthly) the lowest dilution rate, i.e. 74:1 (or D = 73), was used.

(5) For cyanide, another non-persistent pollutant that quickly disperses and degrades like ammonia, the lowest actual dilution rate of 74:1 (or D = 73) was used to calculate the water quality based effluent limits. The background documentation for the proposed cyanide site-specific objectives included an antidegradation analysis that concluded that

cyanide effluent limitations (17 µg/L as an AMEL and 47 µg/L as an MDEL) resulting from implementation of the site-specific objectives (assuming 10:1 dilution) would not degrade water quality. The cyanide limits in this Order (17 µg/L as an AMEL and 45 µg/L as an MDEL) are not greater than those anticipated with the revised site-specific objectives and deemed consistent with antidegradation policies. Therefore, the limits in this Order are consistent with antidegradation policies. Additionally, consistent with the site-specific objective conclusion on antidegradation, to further ensure that water quality is not degraded, this Order requires a cyanide action plan similar to that proposed with the site-specific objective.

c. Summary of Water Quality Based Effluent Limitations

The following table summarizes the WQBELs calculated for each toxic and priority pollutant that was determined to have reasonable potential to cause or contribute to exceedances of the WQOs or WQC. The WQBELs were calculated based on appropriate WQOs/WQC and the procedures specified in Section 1.4 of the SIP, as shown in **Appendix F-3** of this Fact Sheet.

Table F-11. Summary of Water Quality Based Effluent Limitations for Toxic Pollutants

Pollutants	Units	AMEL	MDEL
Copper	µg/L	69	110
Cyanide	µg/L	17	45
Dioxin-TEQ	µg/L	1.4×10^{-8}	2.8×10^{-8}
Total Ammonia as N	mg/L	67	130

d. Development of Effluent Limitations for Specific Pollutants

(1) Copper

i. *Copper WQC.* The saltwater chronic and acute criteria from the Basin Plan and the CTR for dissolved copper for protection of aquatic life are 4.8 and 3.1 µg/L, respectively. Site-specific translators of 0.74 (chronic) and 0.88 (acute), as recommended by the Clean Estuary Partnership's *North of Dumbarton Bridge Copper and Nickel Development and Selection of Final Translators* (2005), were applied to these criteria to convert from dissolved WQC to total WQC. In addition, a water effects ratio (WER) of 2.4, as recommended by the Clean Estuary Partnership's *North of Dumbarton Bridge Copper and Nickel Site-Specific Objective (SSO) Derivation (December 2004)*, was applied, in accordance wit hUSEPA guidance — Interim Guidance on Determination and Use of Water Effect Ratios for Metals (EPA-823-B-94-001). The resulting WQC of 4.2 µg/L for chronic protection and 5.5 µg/L for acute protection were used to perform the RPA.

ii. *RPA Results.* This Order establishes effluent limitations for copper, as the MEC of 12 µg/L exceeds the applicable water quality criteria for this

pollutant, demonstrating reasonable potential by Trigger 1, as defined previously.

iii. *Copper WQBELs.* Copper WQBELs calculated according to SIP procedures and based on a coefficient of variation of 0.33, are 69 µg/L and 110 µg/L for the AMEL and MDEL, respectively. These limitations are based on a minimum initial dilution of 10 to 1 as discussed previously.

iv. *Plant Performance and Attainability.* Statistical analysis of effluent data for copper, collected over the period of October 2003 through September 2006, shows that the 95th percentile (10 µg/L) is less than the AMEL (69 µg/L); the 99th percentile (13 µg/L) is less than the MDEL (108 µg/L); and the mean (6.5 µg/L) is less than the long term average of the projected lognormal distribution of the effluent data set after accounting for effluent variability (53 µg/L). The Regional Water Board concludes, therefore, that immediate compliance with these effluent limitations for copper is feasible.

v. *Alternate Limitations for Copper.* As described in the Clean Estuary Partnership's *North of Dumbarton Bridge Copper and Nickel Site-Specific Objective (SSO) Derivation* (December 2004), the Regional Water Board is proposing to develop site-specific criteria for copper in non-ocean, marine waters of the Region. Proposed site-specific objectives (SSOs) for copper are 2.5 and 3.9 µg/L as four-day and one-hour average criteria, respectively. If these SSOs for copper are adopted, final effluent limitations, calculated according to Section 1.4 of the SIP and continuing to use the WER of 2.4, would be 52 µg/L (AMEL) and 81 µg/L (MDEL). If these SSOs for copper are adopted, the alternate effluent limits will become effective upon the adoption date, so long as the SSOs and their current justification remain unchanged.

vi. *Antibacksliding.* The previous permit included an interim effluent limit of 27µg/L as a monthly average. Since there were no final WQBELs in the previous permit to which to compare the new final WQBELs, there is no backsliding.

(2) Cyanide

i. *Cyanide WQC.* The most stringent applicable water quality criteria for cyanide are established by the NTR for protection of aquatic life in San Francisco Bay. The NTR establishes both the saltwater Criterion Maximum Concentration (acute criterion) and the Criterion Chronic Concentration (chronic criterion) at 1.0 µg/L.

ii. *RPA Results.* This Order establishes effluent limitations for cyanide because the MEC of 26 µg/L exceeds the governing WQC of 1 µg/L, demonstrating reasonable potential by Trigger 1, as defined previously.

iii. *Cyanide WQBELs.* WQBELs for cyanide, calculated according to SIP procedures and based on a coefficient of variation of 1.2, are 17 µg/L and

45 µg/L for the AMEL and MDEL, respectively. These limits are based on a dilution of 74:1 and the non-persistent nature of cyanide.

iv. *Plant Performance and Attainability.* The Discharger's Feasibility Study asserts that it cannot immediately comply with final WQBELs for cyanide. Regional Water Board staff disagrees with the Discharger's assertions for cyanide because the currently proposed limits are higher than those anticipated by the Discharger based on its review of previously drafted limits. The revised limits now reflect a dilution ratio of 74:1, and compliance is feasible.

v. *Alternative Limits for Cyanide.* As described in *Draft Staff Report on Proposed Site-Specific Water Quality Objectives and Effluent Limit Policy for Cyanide for San Francisco Bay*, dated November 10, 2005, the Regional Water Board is proposing to develop site-specific criteria for cyanide. In this report, the proposed site-specific criteria for marine waters are 2.9 µg/L as a four-day average, and 9.4 µg/L as a one-hour average. Based on these assumptions, and the Discharger's current cyanide data (coefficient of variation of 1.2), the AMEL for cyanide will remain the same (17 µg/L) and the MDEL will be 47 µg/L. These alternative limits will become effective only if the SSOs adopted for cyanide are based on the same assumptions as stated in the draft Staff Report of November 10, 2005.

vi. *Antibacksliding.* The previous permit did not specify final WQBELs for cyanide and only contained an interim effluent limitation of 10 µg/L as a daily maximum. Since there were no final WQBELs in the previous permit to which to compare the new final WQBELs, there is no backsliding.

(3) Dioxin - TEQ

i. *Dioxin-TEQ WQC.* Regional Water Board staff derived WQBELs for dioxin-TEQ using the CTR objective for 2,3,7,8-TCDD. This approach is in accordance with 40 CFR 122.44(d)(1)(vi) which allows use of a calculated numeric water quality criterion, such as a proposed stated criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information.

Toxic Equivalency Factors (TEFs) were used to translate the narrative Basin Plan WQO to a numeric WQC for 16 dioxin congeners. The Basin Plan narrative WQO for bioaccumulative substances states:

> "Many pollutants can accumulate on particulates, in sediments, or bioaccumulate in fish and other aquatic organisms. Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered."

This narrative WQO applies to dioxin and furan compounds, based in part on the consensus of the scientific community that these compounds associate with particulates, accumulate in sediments, and bioaccumulate in the fatty tissue of fish and other organisms. USEPA's 303(d) listing determined that the narrative objective for bioaccumulative pollutants was not met in San Francisco Bay because of the levels of dioxins and furans in fish tissue.

The CTR establishes a numeric human health WQO of 0.014 picogram per liter (pg/L) for 2,3,7,8-tetrachlorinated dibenzo-p-dioxin (2,3,7,8-TCDD) based on consumption of aquatic organisms. The preamble of the CTR states that California NPDES permits should use toxicity equivalents (TEQs) where dioxin-like compounds have a reasonable potential with respect to narrative criteria. In USEPA's National Recommended WQOs, December 2002, USEPA published the 1998 World Health Organization Toxicity Equivalence Factor (TEF)[1] scheme. In addition, the CTR preamble states USEPA's intent to adopt revised WQC guidance subsequent to their health reassessment for dioxin-like compounds. The SIP applies to all toxic pollutants, including dioxins and furans.

ii. *RPA Results*. Because the Lower San Francisco Bay is currently listed on the CWA 303(d) list as impaired by dioxins and furans, and dioxins were detected in the effluent (MEC estimated to be 1.44×10^{-9} µg/L) and the background dioxin-TEQ concentration (7.1×10^{-8} µg/L) exceeds the translated WQO (1.4×10^{-8} µg/L), dioxin-TEQ in the discharge has reasonable potential by Trigger 2 to contribute to exceedances of the Basin Plan's narrative bioaccumulation objective.

iii. *WQBELs*. WQBELs for dioxin-TEQ, calculated using SIP procedures as guidance, are 1.4×10^{-8} µg/L and 2.8×10^{-8} µg/L, the AMEL and MDEL, respectively. These limitations are calculated without credit for dilution as discussed previously.

iv. *Plant Performance and Attainability.* The Discharger's Feasibility Study asserts that the facility cannot immediately comply with the WQBELs for dioxin-TEQ. The effluent data are insufficient to determine the distribution of the effluent data set or to calculate a mean and standard deviation, therefore, the feasibility to comply with final effluent limitations is uncertain. The Discharger may be capable of complying with the WQBELs; however, the Discharger has only detected one congener (OCDD) in two out of six samples and both detected values were estimated. Based on the limited available data, the Regional Water Board concurs with the Discharger's assertion of infeasibility to comply.

[1] The 1998 WHO scheme includes TEFs for dioxin-like PCBs. Since dioxin-like PCBs are already included within "Total PCBs," for which the CTR has established a specific standard, dioxin-like PCBs are not included in this Order's version of the TEF scheme.